

What is claimed:

- 5 1. A vertical cavity surface emitting laser (VCSEL) comprising:
an active region;
a contact region in at least one side of the active region providing current to be distributed through the active region; and
10 a stabilizer module for stabilizing the gains among a plurality of modes induced by spatial power instability by increasing the current through the contact region.
2. The VCSEL as recited in claim 1 wherein the VCSEL is an oxide VCSEL.
3. The VCSEL as recited in claim 1 wherein the VCSEL is used in high-speed communication links over a multimode fiber.
- 20 4. A vertical cavity surface emitting laser (VCSEL) used in a multi-channel system, the VCSEL comprising:
an active region;
a contact region in at least one side of the active region providing current to be distributed through the active region; and
25 a stabilizer module for stabilizing the gains among a plurality of modes induced by spatial power instability by increasing the current through the contact region.
- 30 5. The VCSEL as recited in claim 4 wherein the VCSEL is an oxide VCSEL.
- 35 6. The VCSEL as recited in claim 4 wherein the VCSEL is used in high-speed communication links over a multimode fiber.

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a second module for adjusting bias current of the VCSEL to stabilize the modes to compensate for the changes in the operating characteristics.

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16. A stabilizer module for stabilizing a VCSEL, the stabilizer module comprising:
a power module for measuring spatial and spectral power of the VCSEL;
a determination module for determining whether the spatial and spectral
power of the VCSEL is unstable because of modal gains; and
a current module for increasing bias current to a level where the VCSEL is
stable if it is determined that the VCSEL is not stable.

17. The stabilizer module as recited in claim 16 wherein the VCSEL is an oxide VCSEL.

18. The stabilizer module as recited in claim 16 wherein the current module adjusts bias
current up to the saturation level of the VCSEL.

19. The stabilizer module as recited in claim 16 wherein the VCSEL is used in
applications of 1.2 Gb/s and 2.5 Gb/s frequencies

20. The stabilizer module as recited in claim 16 wherein the VCSEL is used in high-speed
communication links over a multimode fiber.